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Understanding the Role of Good Governance and Economic Growth

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Mental Health and Income Inequality in the MENA Region: Understanding the Role of Good Governance and Economic Growth

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Abstract:

The study aims to investigate the relationship between income inequality and mental health by understanding the role of economic growth and good governance in the MENA region. The study adopted panel data analysis from 2021 to 2024 in 10 MENA region countries. It tests for the pooled OLS, the fixed effects, and the random effects. The tests proved that the fixed effects model is the most appropriate way to measure this relationship, as the differences between countries are crucial for this relationship. The study results show that income inequality and work productivity are negatively and significantly affecting mental health in the MENA region. Two sub-indicators of WGI; voice and accountability, and controlling corruption, along with economic growth, are positively and significantly affecting mental health. Economic control variables, namely FDI, inflation rate and unemployment rate, are insignificant factors for mental health. Furthermore, HDI is negatively and significantly affecting mental health in the MENA region. Urgent policies are needed to provide care and support for mental health and social systems to preserve human capital in the MENA region.

Keywords: Mental Health, Income inequality, MENA region, Economic Growth, Egyptian Economy, Institutional Quality.

Introduction:

Mental health has gained increasing attention globally as a basic human right and a fundamental component of humans' overall well-being. Mental health is defined by (WHO, 2025) as "the state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn and work well, and contribute to their community". Mental health conditions are mental health disorders, psychosocial disabilities, and other mental states associated with substantial distress, functioning impairment, or risk of harming oneself.

(WHO, 2022) declared that 11% of the global population is suffering from mental health disorders. The COVID-19 pandemic increased the rates of depression and anxiety in high-income countries by 25%. According to (WHO, 2021) estimates, global annual spending on mental health is less than $2 per person in high-income countries and less than $0.25 per person in low-income countries. The percentage of mental health spending in healthcare budgets is less than 2% on average, across countries' income levels. About 92% of people living in high-income countries are covered by mental health legislation, compared to 36% in low-income countries. A range of 76%-85% of people suffering severe mental disorders in low and middle-income countries are receiving no treatment, compared to 35%-50% in high-income countries.

(Knapp and Wong, 2020) argued that mental health conditions are causing productivity losses and high direct and indirect costs for the economy. Bolduc et al (2024) stated that mental disorders resulting from severe depression cost $326 billion in 2018, compared to $236 billion in 2010, in the USA. (Arias et al., 2022) estimated economic losses due to mental health as 4% of GDP in Eastern Sub-Saharan African countries and 8% in high-income countries of the Northern American region.

The World Health Organization (WHO) adopted the "Comprehensive Mental Health Action Plan for 2013–2030". The focal targets are to strengthen leadership and governance of mental health, provide community-based health and social care, raise awareness and promote prevention arrangements, develop information systems, and conduct evidence-based research on mental health (WHO, 2021).

(WHO 2021; WHO, 2025) defined proactive factors for mental health conditions as being associated with individual factors (psychological and biological factors, skills and behaviors, and family and community), socio-economic factors (poverty, violence, inequality, social protection, economic and financial crises, and working conditions), in addition to local and global threats (national policies, disease outbreaks, climate change, forced displacement, geopolitical and environmental disruptions).

(Macintyre et al., 2018) identified income inequalities, educational inequalities, social justice, unemployment disadvantages, and neighborhood safety as main factors affecting mental health. (De Schutter, 2024) stated that economic disadvantages like poverty, income inequality, and financial insecurity threaten the mental health of poor people three times more than that of high-income people. In addition, children in the poorest households are three times more vulnerable to mental illness compared to children in the best-off households (Murali and Oyebode, 2004).

(WHO, 2022) detailed the vicious cycle between poverty and mental ill-health, informing that people living in poverty or exposed to income inequality are at higher risk of mental health conditions. More than 80% of people with mental disorders live in low- and middle-income countries. Deficiency of financial resources, poor nutrition, and low levels of education, ineffective social safety nets can lead to a lack of healthcare access, low living standards, and fewer employment opportunities, which in turn, increase the hazards of experiencing mental health conditions, risky behavior, and self-harm. On the other hand, people suffering mental health conditions are more vulnerable to falling into poverty through less ability to work effectively, increased health expenditures, and failure to have social support due to stigma and discrimination.

The research Goal: Our study aims to examine the economic determinants of Mental Health in the MENA region. The study employs the data of Algeria, Egypt, Iraq, Jordan, Morocco, Saudi Arabia, Sudan, Syria, Tunisia, and the UAE, during the period of 2021-2024. The study investigates the effects of income inequality on mental health in the MENA region. It identifies the role of economic growth and institutional factors in shaping the mental health levels. It provides evidence-based policy options aiming at adopting economic reforms that influence mental health levels in the MENA region.

The research gap is represented by the shortage of studies discussing Mental Health in the MENA Region and its relationship to income inequality, as well as the impact of institutional factors and economic growth on mental health.

The research methodology: The study applies a Pooled Panel Model to test the impact of income inequality, economic growth, and institutional factors on mental health in the MENA region. The panel model allows for control of individual-specific characteristics that don't change over time. This approach helps reduce estimation bias from omitted variables, provides better modeling of changes and dynamics, and allows for evidence-based policies that can enhance mental health conditions in the MENA region.

The study uses the Mind Health Quotient (MHQ) index from Global Mind Data as the dependent variable. MHQ covers 47 mental health aspects, and is available during the period 2021-2024. The study applies different measures of income inequality (i.e. the GINI coefficient representing the total dispersion of income gaps, the Palma coefficient (Palma and Stiglitz, 2016), and the EIR20 index (UNU-WIDER, 2025), focusing on the gaps between extremely rich and extremely poor. The institutional factors are measured using the Global Governance Index (WGI) and its sub-indicators as a measure of good governance. The control variables include economic growth,

unemployment rates, inflation rates, foreign direct investments, human development Index (HDI), and work productivity.

The research results: The study results show that income inequality and work productivity are negatively and significantly affecting mental health in the MENA Region. Two sub-indicators of WGI; voice and accountability, and controlling corruption, along with economic growth, are positively and significantly affecting mental health. Economic control variables, namely FDI, inflation rate and unemployment rate, are insignificant factors for mental health. Furthermore, HDI is negatively and significantly affecting mental health in the MENA Region.

The research structure: The study structure is as follows: an introduction, a literature review of income inequality, economic growth, and institutional factors affecting mental health in the MENA region, the methodology, data sources, and model specification. Finally, there are the main results, the discussions, and the conclusion.

Literature Review:

Income inequality poses a significant challenge for both developed and developing nations. The International Monetary Fund (IMF) refers to income inequality as the extent to which income is evenly distributed among the population. (IMF, 2025). Global efforts are directed towards the eradication of poverty and income inequality, as part of the main Sustainable Development Goals (i.e. SDG-1, SDG-10).

(Mdingi and Ho, 2021) reviewed a comprehensive literature to examine the interrelation of income inequality and economic growth. They concluded that the relation could be negative, positive, or undefined. Different variables influence the significance and relation direction of income inequality and economic growth, including: level of economic development, technological development, socio-political unrest, savings rate, credit markets, institutions, and population growth. Other studies confirm the multiplicity of income inequality relations to economic growth, like: (Amar and Pratama, 2020; Kuznets, 1985; Rubin and Segal, 2015).

(Murali and Oyebode, 2004) reviewed the various impacts of income inequality on mental health, resulting in poor health. They stated that income inequality can lead to psychosocial stress and is associated with many long-term problems, such as poor health, increased mortality, school failure, crimes, and substance misuse. According to (Healthiw Website, 2025) income inequality significantly harms mental health by reducing social cohesion, increasing chronic stress, and limiting access to resources like adequate housing and quality care, which leads to higher rates of mental illness, particularly in disadvantaged communities and among females.

(Bechtel et al, 2012) used the Household, Income and Labor Dynamics (HILDA) panel survey in Australia to inspect the relationship between income inequality and mental health. The study measured mental health using the Short Form 36 (SF-36) mental health component, referring to low levels of well-being reflected in the absence of confidence, feeling depressed, anxious, and

being unhappy. The study tested two hypotheses: first, the Income Inequality Hypothesis (IIH), which assumes that inequality is harmfully affecting the mental health of the entire reference group, and second, the Relative Deprivation Hypothesis (RDH), which posits that the mental health of some individuals within the group is adversely affected. The study indicated no support for the IIH in Australia, and a minimal effect of RDH on mental health.

(Rakesh et al, 2025) utilized the data from the Adolescent Brain Cognitive Development study in the USA to investigate the association between state-level Gini coefficient and the brain structure and functional connectivity in 17 states. The study was applied to over 8,000 children aged 9–10 years. The study revealed that a higher level of association occurs between income inequality and mental health problems, determined by neurodevelopmental level, which is independent of individual socioeconomic status.

(Immurana et al, 2024) investigated both the individual and the combined effects of mental health disorders and labor productivity on economic growth in Africa. The study used the prevalence rates of five psychosocial disabilities (depression, schizophrenia, dysthymia, bipolar disorder, and anxiety) for 45 African countries over the period 2002–2019. It employed the Generalized Method of Moments (GMM) regression to estimate both the individual and the combined effect of mental health and labor productivity on economic growth. Results showed that the interactions of mental health disorders with labor productivity have a significantly negative impact on economic growth.

Increased prevalence of mental health disorders incentivized the need to investigate the socio-economic factors affecting mental health. (Das and Chatterjee, 2020) examined whether economic growth had long-run co-movements with the depression rate, in the USA, China, India, and Bangladesh, between 1995 and 2016. The study applied the cointegration model, error correction, and causality testing. The panel data results showed long-run relations. It summarized the variables affecting depression in the current period to include: two lagged values of depression rate, economic growth rate, health expenditure level, and voice and accountability.

(Wang and Granados, 2018) showed that higher rates of GDP growth are associated with mental health disorders in China. The study relied on three consecutive surveys of a cohort of 17,000 adults (45 years or older) interviewed during the years 2011/2012, 2013, and 2015. Mental health was defined by depression symptom scores, cognitive impairment, and life dissatisfaction indicators. Results showed no significant difference exists between men and women, with the lower-income population being the most harmed by economic growth.

(Thompson and Kim, 2022) tested the relation between mental health and economic growth in South Korea. The study relied on the Global Health Data Exchange (GHDx) to provide the incidence (number of new cases) of mental disorders and substance-use disorders from 2000 to 2018. Results showed that economic growth is positively and significantly associated with poor mental health in South Korea, for both males and females. Noting that, the increase in mental disorders is higher in females compared to males, while the rise in substance-use disorders is higher

in males compared to females. Reasons are rooted in strict and stressful workplaces, less time for recreation, and rising income inequality.

(Zhu, 2024) examined factors affecting adolescent mental health in the USA between 2014 and 2023. It measured mental health using the prevalence of Major Depressive Episode (MDE) (i.e., at least two weeks of either a depressed mood or a poor interest/pleasure in daily activities). The socio-economic variables covered GDP growth rate, population growth, and Inflation rates. The results indicated that population growth is negatively correlated with adolescent mental problems. But higher GDP growth rates and higher inflation rates are associated with increasing MDE prevalence rates. Socio-economic factors are affecting adolescent mental health through a decline in family purchasing power, an increase in life pressure, and a feeling of the difference in socioeconomic status due to income inequality.

(Louie et al, 2023) investigated the impact of inflation-related hardships on distress in the United States in 2022, using US Household Pulse Survey. Eighteen inflation-related hardships are defined as: purchasing less food, working additional jobs, and delaying medical treatment. Results indicated that a higher number of inflation hardships is associated with higher levels of distress, with no evidence of gender differences in lower numbers of inflation hardships, and increasing distress among men compared to women in higher numbers of inflation hardships.

Furthermore, unemployment is highly linked to mental health conditions, resulting in higher risks of depression, psychological stress, anxiety, and suicide. (Junna et al., 2022) examined the current and the long-term unemployment association with the number of visits to specialized psychiatric health care facilities in Finland. The study employed the labor market data on all residents aged 30–60 years from 2008 to 2018. The study used linear ordinary least squares and fixed-effects models. Results indicated that current unemployment is associated with poor mental health, with a 0.51 percentage-point higher probability of poor mental health among men and women. Risks are increased with long-term unemployment, especially among men in their thirties.

(Jofre-Bonet et al, 2018) relied on the England Health Survey data for about 9000 households during the period 2001 to 2013. The study investigated the relation between recession and unemployment rates, and mental health and other health risk factors (ex, diabetes, obesity, smoking intensity, alcohol consumption). Findings highlighted that uncertainty and negative expectations due to recession and unemployment rates are influencing individual health outcomes and mental health. Higher impacts are present for the less educated population and for women.

(McGee and Thompson, 2015) used data from the Behavioral Risk Factor Surveillance System (BRFSS) in 12 states in the USA, to test for the relationship between unemployment and mental health among youth (aged 18 to 25 years). Findings showed that almost 12% of youth were depressed, and about 23% were unemployed. More unemployed youth were classified with depression compared to employed youth.

(Yang et al, 2024) used a fixed-effects model to examine the relationship between unemployment and mental disorders in 201 countries between 1970 and 2020. Various mental health outcomes were observed, namely anxiety, depression, bipolar disorder, drug use, and eating disorders. Findings revealed a significant positive association between mental disorders and unemployment, GDP per capita growth, urbanization, globalization, and the number of out-of-school children. As for institutions, they exhibited a negative and significant impact on mental health disorders, while forms of democracies had no significant effect.

(Bubonya et al, 2017) analyzed the relation between mental health and workplace productivity. using data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. Results revealed that absence rates are 5% higher among workers who report being in poor mental health. Additionally, job conditions are highly contributing to diminished productivity at work.

(Thaivalappil et al, 2023) investigated the comprehensive literature covering institutional-level factors affecting the mental health and well-being of students in Canada. The study reviewed a total of 33 relevant studies using a comprehensive search strategy, relevance screening, confirmation, and data charting. Major findings illustrated that institutional attitudes, institutional actions, perceived campus safety, and campus climate are associated with students' mental well-being in Canada.

(Kakemam et al, 2024) tested the relation between mental health disorders and good governance, social support, quality of life, and perceived discrimination in Iran. They applied a field study on 725 Iranian adults in Northwest Iran (Tabriz). The results found that nearly 70% reported experiencing mental health problems. Good governance had a significant indirect and negative effect on mental health disorders through the quality-of-life indicators.

(Hadipour, 2023) investigated the impact of institutional quality on health system outcomes. The study utilized the World Governance Indicators (WGI) for 158 countries within the period 2001 and 2020. It applied the Principal Component Analysis (PCA), fixed effects model, and generalized method of moments (GMM) models. The results revealed that institutional quality had a negative impact on infant mortality rates and a positive impact on life expectancy. Other variables such as GDP, mean years of schooling, total health expenditure, and urbanization rate showed similar results. The study emphasized the necessity of enhancing institutional quality in shaping health system outcomes.

(Cifuentes et al, 2008) discussed the association of major depressive episodes (MDE) with income inequality and the human development index (HDI) in 65 countries. Results showed that moderately developed countries had the lowest MDE, followed by high and low developed countries. Fundings indicated that an increase in MDE level in highly developed countries is positively associated with high income inequality. Shedding light on the role of income inequality on social forces that can lead to depression.

For the MENA region, (Fikry, 2023) investigated the impact of socio-economic factors on mental health in the MENA region (Jordan, Morocco, Tunisia, and Egypt). Results showed that food insecurity, income decline, and anxiety about COVID-19 infection worsened mental health in these countries. Whereas other socio-economic factors (age, gender, family size, marital status, and recipient of social support) are insignificantly related.

(Hussien et al, 2025) investigates the relationship between economic growth and health outcomes in Saudi Arabia. Results showed that economic growth enhances healthcare access and longevity, but also increases the health risks in the country.

(Economist Impact, 2023) examines the mental health policies applied in six MENA region countries (Egypt, Jordan, Kuwait, Qatar, Oman, and Saudi Arabia). It created the "MENA Mental Health Scorecard" covering 16 indicators in three main domains: government commitment and accountability, empowering individuals and communities, and accessibility of mental health services. Findings highlighted the need to strengthen the mental health policy and legislative environment, increase awareness and education efforts for mental health literacy, and integrate mental health into primary healthcare services and ongoing digital transformation.

(Al-Huseini and Arafat, 2025) discussed the accessibility of mental health services in the Middle East countries and the main challenges. Results indicated lower accessibility to mental health services by people with mental illness. Key challenges include insufficient funding provided by the government, substantial household out-of-pocket expenses on mental healthcare, a shortage of skilled professionals (psychiatrists, psychologists, mental health nurses, social workers, and other specialized workers), low levels of mental health literacy, and a high level of stigma. Middle East governments are making efforts to address this gap through improved mental health policies and programs.

Mental Health Burden in the MENA region

Mental disorders are among the top 10 leading causes of health loss worldwide, with anxiety and depression disorders ranked as the most common mental health conditions. In 2023, 15% of the world's population experienced mental disorders. About 17% of the total years lived with disability in the world were due to mental disorders in 2023. The MENA region is no exception. Table (1) represents the burden of mental health and the percentage of mental health conditions in the total disease burden in 2019, in the MENA region, compared to the global level and income level countries.

Table (1): The Burden of Mental illness in the MENA region in 2019

	Prevalence of Mental Health Conditions	Mental Health Conditions as a Percentage of the Total Disease Burden	Prevalence of anxiety disorder	Prevalence of depression
Egypt	14.6%	6.7%	4.8%	4.1%
Jordan	16.3%	10.2%	5.2%	4.4%
Kuwait	14.1%	12.2%	4.9%	4.4%
Oman	13.7%	10.4%	4.8%	4.1%
Qatar	13.6%	13.7%	4.5%	4.2%
Saudi Arabia	13.7%	8.9%	4.8%	4.4%
High-income countries	14.9%	6.7%	5.3%	4.0%
Upper middle-income countries	12.5%	5.7%	4.2%	3.3%
Lower middle-income countries	12.8%	4.3%	3.4%	3.7%
Global level	15%	5%	3.8%	3.4%

Source: IHME (Institute for Health Metrics and Evaluation) (2019). Global Burden of Disease. In: Mental Health in the MENA Region: Breaking Stigmas and Promoting Well-being. **Institute for Health Metrics and Evaluation**. https://duphat.ae/mental-health-in-the-mena-region-breaking-stigmas-and-promoting-well-being/

According to 2019 data, the prevalence of mental health conditions ranges between 13.6% in Qatar and 16.2% in Jordan. Mental health conditions, as a share of the total disease burden, averaged 12% in Kuwait, Jordan, Oman, and Qatar, compared to the global average of 5%. Saudi Arabia and Egypt averaged 8.7% and 6.7% respectively**.** Although overall prevalence rates of mental health conditions appear on par or even slightly low compared with the global average in some countries, locally reported figures are often higher.

Table (2) shows that the Disability-Adjusted Life Years (DALY) scores (one DALY equals one lost year of healthy life) are high in Morocco and Tunisia, followed by Sudan and Syria. The total number of mental health professionals is 7.2 thousand in Syria, followed by 6.1 thousand in Saudi Arabia and 5.8 thousand in Egypt.

Table (2): Total Burden of Disease and Availability of Mental Health Professionals in the MENA region, in 2020.

	Disability-adjusted life years* (per 100,000 population)	Age-standardized suicide mortality rate (per 100,000 population)	Total number of mental health professionals	No. of mental health professionals (per 100,000 population)
Algeria	1 861.0	2.6	976	2.27
Egypt	1 814.9	3.41	5 854	5.83
Iraq	1 844.2	4.74	777	1.98

	Disability-adjusted life years* (per 100,000 population)	Age-standardized suicide mortality rate (per 100,000 population)	Total number of mental health professionals	No. of mental health professionals (per 100,000 population)
Jordan	1 897.7	1.98	417	4.13
Morocco	2 055.8	7.29	1 989	5.45
Saudi Arabia	1 846.3	5.43	6 064	17.70
Sudan	1 945.0	4.76	878	2.05
Syria	1 954.4	2.11	7 259	42.52
Tunisia	2 106.0	3.18	1 026	8.77
UAE	1 712.2	5.24	4 914	50.29

* Disability-Adjusted Life Years (DALY) measures the total burden of disease. One DALY equals one lost year of healthy life.

Source: WHO (World Health Organization). (2024). Mental Health Atlas 2024. https://www.who.int/publications/i/item/9789240114487

(Newson and Thiagarajan, 2020) demonstrated the new web-based assessment tool of mental health named Mental Health Quotient (MHQ). The MHQ covers the complete clinical mental health symptoms and also captures healthy mental functioning, so that it can provide a complete profile of an individual's mental health from clinical to thriving. Mental health symptoms and attributes were formulated into questions on a 9-point scale with both positive and negative dimensions and used as a web-based assessment tool.

Table (3) represents the development of MHQ scores in MENA between 2021 and 2024.

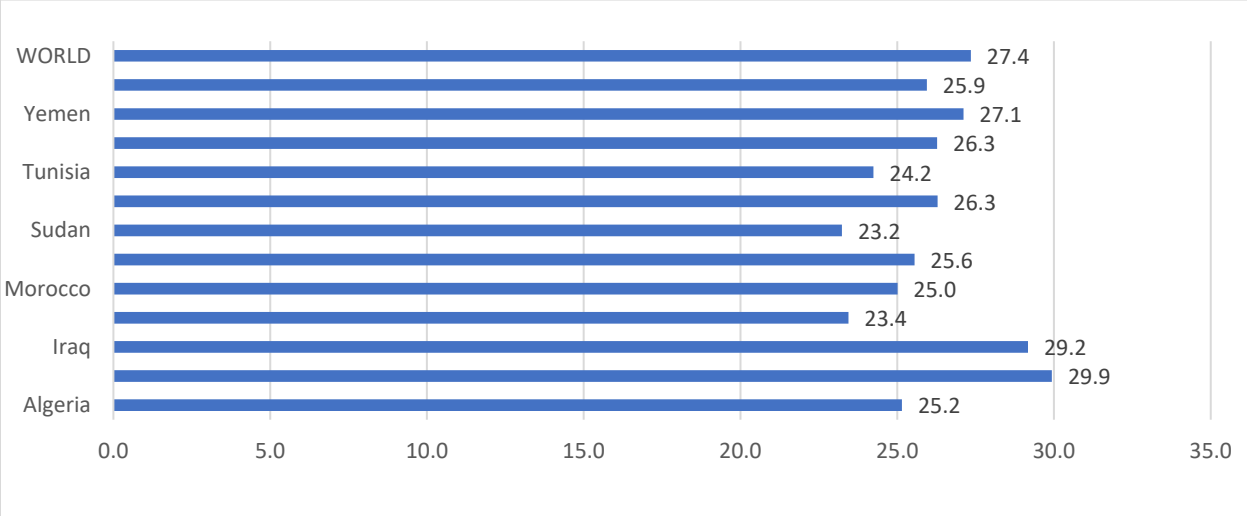
Table (3): Mind Health Quotient (MHQ) scores in MENA region between 2021-2024

	2021	2022	2023	2024
Algeria	68.9	66.3	63.8	62.2
Egypt	59.9	58.4	54.9	54.7
Iraq	57.4	58.2	55.8	54.6
Jordan	68.4	68.0	68.0	67.4
Morocco	69.5	68.8	64.0	63.8
Saudi Arabia	68.3	70.2	67.8	66.2
Sudan	65.7	66.1	64.0	65.7
Syria	64.1	64.2	64.3	64.3
Tunisia	72.6	64.4	66.7	63.6
Emirates	73.3	70.0	67.3	65.7
Yemen	64.3	63.1	58.6	58.5
MENA	66.6	65.3	63.2	62.4
WORLD	64.9	64.3	64.7	62.8

Source: Sapian Labs. (2025). What is your Mental Wellbeing Score? https://sapienlabs.org/mhq/

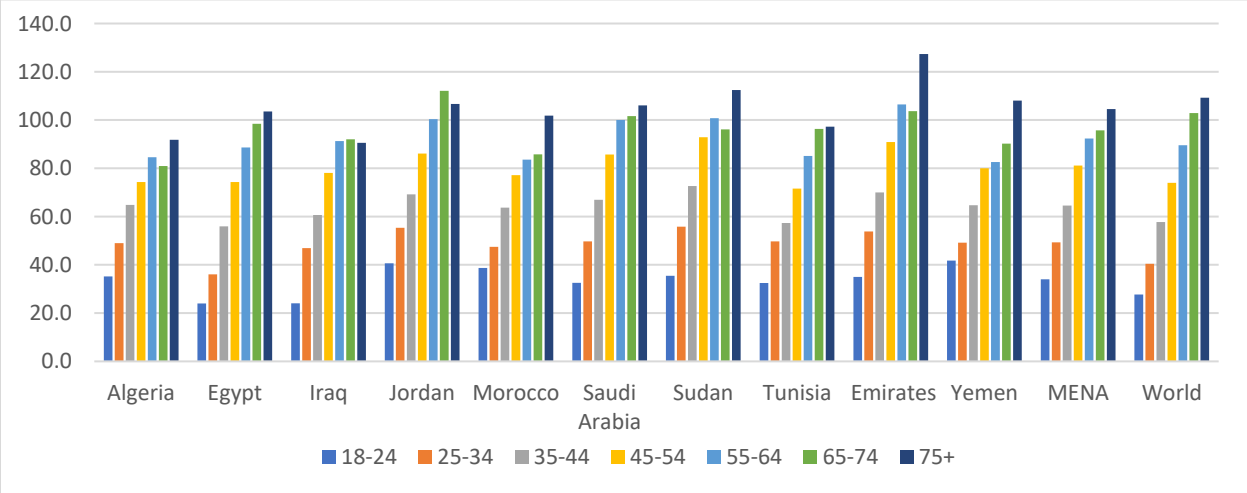
Mental health scores are declining in almost all countries between 2021-2024, as presented in Table (3). Studies confirm that mental health levels have declined significantly, particularly after the COVID-19 pandemic (Sapian Labs, 2025).

Figure (1) shows that people who experienced mental disorders or suffering in MENA ranged between 23% - 29% out of each country's total, in 2024. Noting that Egypt and Iraq have the highest percentage as recorded by MHQ scores.



Source: Sapian Labs. (2025). What is your Mental Wellbeing Score? https://sapienlabs.org/mhq/

Figure (1): Percentage of people experiencing mental disorder or suffering in MENA region in 2024, according to MHQ scores.



Source: Sapian Labs. (2025). What is your Mental Wellbeing Score? https://sapienlabs.org/mhq/

Figure (2): Mind Health Quotient (MHQ) scores in MENA region in 2024 by age group

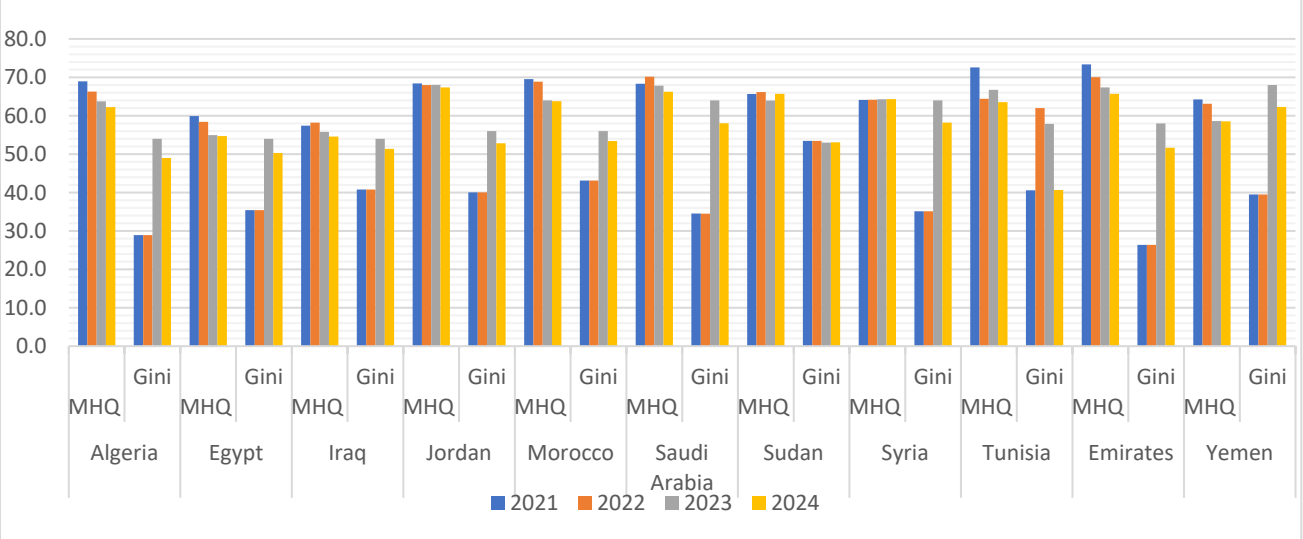
Figure (2) presents the evidence that mental health is higher in the above age groups in MENA region, compared to younger ages, where older adults generally enjoy better mental health than young people.

Table (4): Mind Health Quotient (MHQ) scores in MENA region in 2024 by gender

Gender	Male	Female	The score gap
Algeria	63.5	60.9	2.6
Egypt	60.1	49.3	10.8
Iraq	58.8	50.3	8.5
Jordan	68.3	66.4	1.9
Morocco	69.4	58.4	11
Saudi Arabia	69.8	60.7	9.1
Sudan	65.7	65.7	0
Tunisia	66.1	61.1	5
Emirates	67.8	60.1	7.7
Yemen	63.6	53.5	10.1
MENA	65.3	58.6	6.7
World	66.2	59.5	6.7

Source: Sapian Labs. (2025). What is your Mental Wellbeing Score? https://sapienlabs.org/mhq/

Table (4) shows that males generally enjoy better mental health than females, both globally and in the MENA region. The score gap between males and females is the highest in Egypt, followed by Saudi Arabia and Iraq. Notably, Sudan is the only country with no gaps between males and females in their MHQ score.



Source: Sapian Labs. (2025). What is your Mental Wellbeing Score? https://sapienlabs.org/mhq/

Figure (3): Mind Health Quotient (MHQ) scores in MENA region compared to Gini Coefficient between 2021-2014.

Figure (3) shows an increased level of income inequality in the MENA region, represented by a higher GINI coefficient between 2021 and 2024. Tunisia has the lowest levels of income inequality, while Yemen has the highest level in 2024. This is associated with declining levels of MHQ scores between 2021 and 2024 in almost all countries.

Data and Methodology:

The study aims to examine the economic determinants of Mental Health in the MENA region. It investigates the effects of income inequality, economic growth, and institutional factors in determining the mental health levels in the MENA region.

This study aims to provide evidence on the dynamics of income inequality and mental health. It tests the main hypothesis that “Income inequality harms mental health in the MENA region." And tests the hypothesis that "Both institutional quality and economic growth have a positive impact on mental health in the MENA region."

The study employs a Panel data model to test the impact of income inequality, economic growth, and institutional factors on mental health in MENA countries, during the period of 2021-2024. using data from 10 countries in the MENA region.

The dependent variable is the Mind Health Quotient (MHQ) index from the Global Mind Project Database. The MHQ is an index that measures mental health and well-being, on a scale of -100 to +200, with negative scores indicating severe mental distress and functional impairment, and positive scores indicating good mental performance. The MHQ index covers 47 mental health aspects, including emotional, cognitive, and social aspects, demographic aspects, lifestyle factors, friend and family dynamics, trauma, and hardship. (Sapian Labs, 2025).

The six main dimensions of the MHQ index are: mood and outlook, social self, adaptability and resilience, drive and motivation, cognition, and mind-body connection. **Mood and Outlook** reflect the ability to manage and regulate emotions effectively and to have a constructive or optimistic outlook for the future. **Social Self** indicates how the individual interacts with, relates to, and sees himself with respect to others. **Drive and Motivation** indicate the ability to work towards achieving desired goals and to initiate, persevere, and complete activities in daily life. **Cognition** represents the ability to perform basic cognitive functions, make sense of complex sets of events and situations, and display a longer-term perspective in thoughts and behavior. **Adaptability and Resilience** indicate the ability to shift behavior and outlook in response to changing circumstances and cope with the challenges and setbacks that are encountered. **Mind-Body Connection** reflects the regulation of the balance between mind and body.

The MHQ index is distinguished from other mental health indicators as it reflects how individuals’ internal state affects their ability to work, in the context of their life, rather than absolute human mental function (Sapian Labs, 2025). In other words, the MHQ Index covers abilities, social

interaction, and the performance of daily functions, not just mental disorders. Making it an appropriate indicator to study psychological well-being, not only mental illness.

The independent variables include income inequalities, economic, and institutional variables. The income inequality is measured using the GINI coefficient, which represents the total dispersion of income gaps, the Palma coefficient, and the EIR20 index, which focuses on the gaps between the upper rich and the extreme poor quintiles. The data is extracted from the World Income Inequality Database (WIID). The researchers believe that these three transactions have an integrative perspective of income inequality within society.

The economic variables are GDP per capita as a measure of economic growth, total fixed capital formation to express domestic investment, In addition to unemployment rates, inflation rates, human capital, public consumption expenditure ratio, and foreign direct investment.

The institutional quality is measured using the Global Governance Index (WGI). The WGI is used at its aggregate level and at its sub-indices. This is to identify the role of each sub-indicator in the relationship between mental health and income inequality. Table (5) represents the study variables and sources of data.

The study model was built based on the following studies (Das & Chatterjee, 2023; Huang & Ho, 2018; Kapila, 2021). The study model takes the following form:

$$MHQ_{i,t} = \beta_0 + \beta_1 GINI_{it} + \beta_2 Gdppc_{it} + \beta_3 PROD_{it} + \beta_4 inf_{it} + \beta_5 FDI_{it} + \beta_6 HDI_{it} + \beta_7 GG_{it} + \beta_8 Unemp_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(1)}$$

The model in equation (1) is estimated using the Pooled Panel Data Model and tested for fixed effects and random effects. The study used the Hausman test to determine the most appropriate model for estimation. Besides, the study used the Breusch-Pagan Lagrange multiplier (LM) for the trade-off between the random effects method and the pooled ordinary least-squares method.

Table (5): Variables Description and Data Sources

Variables	Symbol	Interpretation	Unit of Measurement	source
Mental Health	MHQ	Mental Health Quotient Index: This indicator consists of six dimensions. The MHQ cycles range from -100 to +200, with negative scores indicating severe mental distress and functional impairment. Positive scores represent a normal distribution of mental performance. The data is calibrated at an average of 100 based on pre-pandemic data for 2019, similar to the IQ scale.	Percentage	Sapian Labs

Variables	Symbol	Interpretation	Unit of Measurement	source
GINI	GINI	It measures the extent to which the distribution of income among individuals or households deviates from the perfectly equal distribution of the economy. A value of 0 represents total equality, while a value of 100 represents complete inequality.	Percentage	World Income Inequality Database (WIID)
PALMA	PALMA	The ratio of the income share of the top 10% of the population (the richest) to the income share of the bottom 40% of the population (the poorest). A value of 1 indicates the complete equality between the share of the rich and the share of the poor.	Percentage	World Income Inequality Database (WIID)
EIR20	EIR20	The ratio of the income share of the top 20% of the population to the income share of the bottom 20%. A value of 1 (100%) indicates the complete equality between the highest and lowest 20%. The higher the value is above 100%, the greater the income inequality	Percentage	World Income Inequality Database (WIID)
Good governance	GG	It is the ratio of the arithmetic average of the six sub-indicators of good governance.	Percentage	Worldwide Governance Indicators
Government Effectiveness	GE	It measures the quality and degree of independence of public and civil services, the quality of policy formulation and implementation, and the credibility and commitment of government to these policies.	Percentage	Worldwide Governance Indicators
Voice and Accountability	VA	It reflects perceptions about the extent to which citizens can participate in the choice of their representatives, freedom of expression, freedom of association, and freedom of the media.	Percentage	Worldwide Governance Indicators
Political stability and non-violence	PS	It measures the likelihood of political instability and/or politically motivated violence, including terrorism.	Percentage	Worldwide Governance Indicators

Variables	Symbol	Interpretation	Unit of Measurement	source
Organizational Quality	RQ	It measures the ability of the government to formulate and implement sound policies and regulations and allow for the development and promotion of the private sector.	Percentage	Worldwide Governance Indicators
Rule of Law	RL	It measures the extent to which agents trust and adhere to community rules, contract enforcement, property rights, the police, the courts, and the likelihood of crime and violence.	Percentage	Worldwide Governance Indicators
Controlling corruption	CC	It measures the extent to which public power achieves private gains, whether small or large, and the degree to which elites and stakeholders take over the state.	Percentage	Worldwide Governance Indicators
Work Productivity	L-PROD	Algorithm of the worker's share of GDP at constant prices for 2021	Percentage	KOF Swiss Economic Institute
Foreign Direct Investment	FDI	Net FDI inflows as a percentage of GDP.	Percentage	World development Indictors
Economic Growth	Gdppc	Algorithm of GDP per capita in 2015 prices.	Percentage	World development Indictors
Inflation	inf	It is measured by the annual growth rate of the implied deflater coefficient of GDP for the rate of price change in the economy as a whole.	Percentage	World development Indictors
Human Capital	HDI	The logarithm is represented by the years of study and the returns on education.	Percentage	World development Indictors
Unemployment	Unemp	Total unemployment as a percentage of the total labor force.	Percentage	World development Indictors

Results and Discussion:

Table (6) shows the descriptive statistics of the study variables. There is a large disparity between the 10 countries of the MENA region in mental health, in particular in income inequality, economic growth, inflation rates, institutional quality, and foreign direct investment.

Table (6)

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MHQ	40	64.695	4.771	54.556	73.343
Gini	40	46.688	10.781	26.381	64
Eir20	40	7.408	2.944	4.255	14.733
Palma	40	1.813	.795	.891	3.845
l Gdppc	40	8.378	1.233	6.366	10.662
INF	40	34.207	60.789	-15.535	243.669
l prod	40	10.759	.679	9.496	11.905
Corr	40	35.686	26.025	.472	83.491
Eff	40	40.395	29.499	2.096	96.051
PS	40	24.127	20.727	0	73.444
RQ	40	34.965	26.85	3.774	82.075
RL	40	37.154	25.765	.943	79.351
VC	40	19.047	12.405	.966	52.174
GG	40	31.895	21.777	1.576	72.204
FDI	40	1.789	2.616	-2.667	11.972
HDI	40	2.604	.467	1.633	3.34
Unemp	40	10.954	4.967	2.133	19.837

The pooled OLS specification neglects unique characteristics of individual countries and doesn't take into account the cross-sectional data or the time series nature. (Torres-Reyna, 2007). Breusch–Pagan LM is applied to evaluate the trade-off between the random effects model and the pooled ordinary least-squares model. The null hypothesis in the LM test is that the variances across entities are zero. Revealing that there is no significant difference across units. Since (p) is 0.0012, the null hypothesis can be rejected. Therefore, the random effects model is the best fit for the current data, as shown in Table (7).

Table (7)

Breusch and Pagan Lagrangian Multiplier Test for Random Effects

MHQ[Countries,t] = Xb + u[Countries] + e[Countries,t]		
Estimated results:		
	Var	SD = sqrt(Var)
MHQ	22.75776	4.770509
e	1.990369	1.410804
u	11.38845	3.374678
Test: Var(u) = 0		
chibar2(01) =9.14		
Prob > chibar2 =0.0012		

The study applied Hausman's test to assess whether the estimates of β from the fixed effects and random effects models differ significantly. The null hypothesis of the test states that there is no systematic difference between the estimators being compared, meaning that the random effects

model is consistent and efficient, making it the preferred model. Since (p) is 0.0061, null hypothesis can be rejected. According to Table (8), the most appropriate model is the fixed effects model, which assumes that countries' mental health is affected by their own internal characteristics

Table (8)
Hausman Test for Random Effects Model

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 21.44
Prob > chi2 = 0.0061

Table (9) through (11) show the results of the pooled OLS, fixed effects, and random effects models. They show the impact of the three indices of income inequality on mental health. Income inequality is represented using the GINI coefficient (Table 9), Eir20 index (Table 10), and Palma index (Table 11). The tables also reflect the estimated impact of aggregate institutional quality, the individual WGI sub-indices, and control variables on mental health.

Based on the fixed effects model, results show an inverse and significant relation between income inequality and mental health for the GINI coefficient and severe income inequality Eir20 indices, while it is insignificant for Palma index. Indicating that increasing levels of income inequality negatively affect mental health in the 10 countries of the MENA region. Higher inequality is linked to greater anxiety, depression, and psychological stress. Feeling unfairness or being deprived due to income gaps can lead to worse mental health. (Salem and Robenson, 2025). This calls for state intervention to redistribute income so that mental health issues might be lessened.

The study also illustrates that an increase in work productivity leads to a decrease in mental health levels. This could be due to factors like excessive workload and poor work-life balance, leading to stress, anxiety, and burnout, resulting in mental and physical health issues (Bubonya et al, 2017).

The results also confirm that a positive and significant relationship exists between economic growth rates and mental health, with different significance levels across models. The positive impact of economic growth on mental health could be explained by improved living conditions and the availability of health infrastructure in the 10 countries of the MENA region. (Hussien et al, 2025). However, this contrasts with the findings of (Zhu, 2024; Wang and Granados, 2018) of a negative and significant impact on mental health.

Aggregate institutional quality is an insignificant factor for mental health, which is inconsistent with the findings of (Hadipour et al, 2023), except for the Eir20 fixed effects model. Delving deeper into the impact of the individual indices of institutional quality, the results indicate that the voice and accountability index and the controlling corruption index have a positive and significant impact on mental health. Other institutional quality sub-indicators are all insignificant. Voice and accountability can build public trust in health institutions, which is a key factor for mental well-

being. In addition, controlling corruption can improve the equity of public health services accessibility, which further supports mental health. (Pham, 2025).

As for inflation and unemployment, results indicate an insignificant relation with mental health, as well. Which means that the policies to attract FDI, lower inflation rates, fight unemployment, and incentivize decent work are insufficient to affect mental health in the MENA region. This contradicts the literature, which asserts that inflation-related hardships are associated with higher levels of distress and that unemployment is correlated with mental health issues, due to stress, reduced self-esteem, and feeling insecure. (Louie et al, 2023; McGee and Thompson, 2015; Junna et al, 2022). Investment, expressed as FDI is also found to be insignificant in affecting mental health.

The Human Development Index has a negative and significant impact on mental health. Indicating that increasing levels of HDI negatively affect mental health in the 10 countries of the MENA region. It is also notable that the low mental health indicators are found in the high HDI developed countries. HDI measures overall development, including health, education, and income, with a special focus on longevity and general health conditions. It is also worth noting that mental health is shaped mainly by social determinants, social support, and lifestyle choices, which are not reflected in the HDI calculations. (Shahbazi et al, 2022). This suggests that the improved levels of HDI in the MENA region are not reflected in better mental health conditions.

Table (9): Estimating Factors Affecting MHQ (income inequality is represented by GINI coefficient)

	Pooled OLS	Random effects	Fixed Effects Agg WGI	Fixed Effects Indv. WGI 1	Fixed Effects Indv. WGI 2	Fixed Effects Indv. WGI 3	Fixed Effects Indv. WGI 4	Fixed Effects Indv. WGI 5	Fixed Effects Indv. WGI 6
	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ
Gini	-.123**	-.141***	-.105***	-.094***	-.093***	-.09***	-.088***	-.112***	-.105***
	(.049)	(.028)	(.029)	(.023)	(.026)	(.022)	(.024)	(.027)	(.026)
l_Gdppc	.347	1.724	6.052**	3.785	7.723***	7.688**	7.883***	3.274	5.109*
	(2.947)	(4.509)	(2.266)	(2.318)	(2.175)	(2.673)	(2.168)	(3.813)	(2.484)
INF	.033**	.007**	.003	.003	.004	.004	.005	.004	.005
	(.012)	(.003)	(.004)	(.002)	(.003)	(.003)	(.003)	(.003)	(.003)
l_prod	-3.942	-6.484	-26.282***	-20.595**	-27.328***	-27.461***	-27.249***	-24.482**	-23.917**
	(3.993)	(7.689)	(7.282)	(7.615)	(7.587)	(6.851)	(7.538)	(7.833)	(7.84)
FDI	-.681***	-.161	.139	.071	.141	.153	.15	.147	.114
	(.164)	(.102)	(.091)	(.077)	(.119)	(.115)	(.118)	(.099)	(.114)
HDI	.159	-4.087	-36.007***	-30.254***	-38.78***	-39.561***	-39.287***	-35.679***	-36.334***
	(1.47)	(5.039)	(6.108)	(5.831)	(6.215)	(6.289)	(7.112)	(6.567)	(7.024)
Unemp	.008	.161	.332	.248	.209	.219	.162	.242	.037
	(.175)	(.203)	(.43)	(.431)	(.408)	(.345)	(.44)	(.393)	(.448)
GG	.279***	.261	.219						
	(.075)	(.165)	(.131)						
Corr				.351***					
				(.09)					
Eff					.032				
					(.062)				
PS						.027			
						(.129)			
RQ							-.004		
							(.077)		
RL								.27	
								(.159)	
VC									.229***
									(.056)
_cons	100.621***	127.197***	384.476***	322.271***	395.396***	399.524***	396.215***	385.731***	373.609***
	(21.904)	(42.489)	(65.409)	(69.971)	(72.002)	(63.304)	(71.71)	(69.647)	(70.684)
Observations	40	40	40	40	40	40	40	40	40
R-squared	.673	.z	.752	.78	.731	.73	.729	.76	.799

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table (10): Estimating Factors Affecting MHQ (income inequality is represented by Eir20 index)

	Pooled OLS	Random effects	Fixed Effects Agg WGI	Fixed Effects Indv. WGI 1	Fixed Effects Indv. WGI 2	Fixed Effects Indv. WGI 3	Fixed Effects Indv. WGI 4	Fixed Effects Indv. WGI 5	Fixed Effects Indv. WGI 6
	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ
Eir20	-.455	-1.324*	-67.539**	-2.903	-40.809**	-22.696**	-38.574***	-38.514	5.315
	(.456)	(.759)	(25.058)	(9.841)	(12.954)	(9.357)	(11.616)	(22.098)	(30.757)
l_Gdppc	1.27	5.156	10.121**	1.607	6.216***	5.457*	3.722	10.38	2.474
	(3.013)	(4.416)	(3.386)	(2.94)	(1.629)	(2.574)	(2.149)	(6.634)	(2.92)
INF	.042**	.012	.007*	.002	.007*	.004	.006*	.003	.004
	(.019)	(.01)	(.004)	(.002)	(.003)	(.003)	(.003)	(.003)	(.003)
l_prod	-4.275	-8.222	-19.418**	-14.575	-17.951**	-17.797*	-15.674*	-21.599**	-17.325**
	(4.172)	(6.313)	(8.01)	(8.137)	(7.013)	(7.924)	(7.831)	(7.593)	(7.254)
FDI	-.635***	-.219	.123	.026	.171	.081	-.009	.094	.057
	(.18)	(.138)	(.128)	(.162)	(.104)	(.171)	(.179)	(.148)	(.197)
HDI	-2.255	-11.151**	-40.212***	-39.158***	-39.481***	-40.571***	-49.002***	-41.775***	-46.227***
	(3.061)	(4.358)	(6.853)	(9.383)	(9.322)	(10.794)	(8.094)	(6.066)	(8.074)
Unemp	.124	.563*	.355	.747	.445	.574	.403	.672	.561
	(.205)	(.322)	(.509)	(.605)	(.568)	(.565)	(.501)	(.608)	(.568)
GG	.278***	.183	-.657*						
	(.085)	(.163)	(.338)						
Corr				.289					
				(.163)					
Eff					-.239*				
					(.123)				
PS						-.101			
						(.177)			
RQ							-.272**		
							(.119)		
RL								-.323	
								(.38)	
VC									.203
									(.24)
_cons	98.774***	136.787***	810.454***	312.919**	615.142***	480.103***	620.407***	608.586***	301.135
	(24.587)	(52.44)	(189.375)	(127.41)	(62.229)	(61.127)	(102.806)	(172.046)	(228.959)
Observations	40	40	40	40	40	40	40	40	40
R-squared	.623	.z	.707	.688	.716	.677	.719	.684	.688

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table (11): Estimating Factors Affecting MHQ (income inequality is represented by Palma index)

	Pooled OLS	Random effects	Fixed Effects Agg WGI	Fixed Effects Indv. WGI 1	Fixed Effects Indv. WGI 2	Fixed Effects Indv. WGI 3	Fixed Effects Indv. WGI 4	Fixed Effects Indv. WGI 5	Fixed Effects Indv. WGI 6
	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ	MHQ
Palma	-1.899	-5.502**	-124.468	-18.815	-102.546**	-67.308**	-139.312**	-149.338	128.715
	(1.754)	(2.72)	(73.436)	(22.51)	(37.093)	(25.36)	(43.331)	(118.552)	(183.218)
l_Gdppc	.861	4.628	6.681*	1.632	5.723**	5.145*	3.882*	10.276	.713
	(2.973)	(4.253)	(3.293)	(2.595)	(1.87)	(2.581)	(1.845)	(7.251)	(3.812)
INF	.042**	.011	.005	.002	.006	.004	.007*	.004	.004
	(.018)	(.01)	(.004)	(.002)	(.003)	(.003)	(.003)	(.004)	(.003)
l_prod	-4.006	-8.039	-19.162**	-14.463*	-18.701**	-18.521**	-15.93**	-21.353**	-17.103**
	(4.159)	(5.765)	(7.335)	(7.784)	(6.716)	(7.209)	(7.016)	(7.074)	(7.311)
FDI	-.605***	-.204	.054	.019	.099	.06	-.051	.039	.084
	(.187)	(.137)	(.179)	(.159)	(.163)	(.184)	(.218)	(.171)	(.206)
HDI	-2.444	-11.851***	-39.438***	-38.462***	-39.155***	-40.744***	-44.757***	-37.613***	-53.435***
	(3.064)	(4.209)	(8.453)	(9.86)	(9.794)	(10.381)	(9.798)	(6.628)	(12.18)
Unemp	.104	.543*	.507	.745	.472	.603	.327	.564	.428
	(.189)	(.318)	(.576)	(.58)	(.557)	(.559)	(.498)	(.666)	(.586)
GG	.283***	.188	-.227						
	(.087)	(.167)	(.297)						
Corr				.282*					
				(.137)					
Eff					-.136				
					(.106)				
PS						-.048			
						(.161)			
RQ							-.246*		
							(.113)		
RL								-.315	
								(.424)	
VC									.384
									(.355)
_cons	99.87***	141.285***	544.655***	322.562***	505.792***	443.292***	577.571***	582.344**	136.252
	(24.551)	(49.625)	(140.666)	(84.326)	(46.795)	(36.284)	(67.629)	(200.425)	(297.27)
Observations	40	40	40	40	40	40	40	40	40
R-squared	.625	.z	.674	.689	.687	.667	.708	.678	.701

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Conclusions and Policy Implications:

The current research explores the relationship between mental health and income inequality, with special focus on economic growth and good governance in the MENA region. The study applied Panel Model analysis using 10 MENA countries during the period from 2021 to 2024. The tests confirmed that the fixed effects method is the optimal way to estimate the required relation. Accordingly, differences among countries are essential for explaining such a relationship. The results show an inverse and significant relationship between income inequality and mental health, which means that worsening income inequality increases the severity of mental illness. Economic growth and good governance also have a positive and significant impact on mental health. The findings also proved that labor productivity increase is accompanied by a lower level of mental health in the MENA region. Finally, the HDI is negatively affecting mental health, perhaps because the Human Development Index is based on components that do not include mental health, as longevity is not an indicator of healthy mental health.

Policy interventions are required to maintain mental health in the MENA region, as follows:

Policy Options:

- As income inequality is inversely related to mental health, the government is encouraged to expand social solidarity programs that help reduce income inequality and ensure the preservation of citizens' mental health in the MENA region.
- Raising awareness among the poor and the rich for mental health conditions and providing families with access to mental health resources. Use digital technology to expand primary care providers and improve access to mental health services.
- In light of the direct relationship between overall institutional quality and mental health, it is important to activate the government's institutional reform program to improve the efficiency and effectiveness of health care accessibility, especially mental health care.
- The government should integrate mental health services into primary care, promote community-based support, and address stigma through education and partnerships with community and religious leaders. Key strategies involve developing culturally sensitive programs, increasing funding for mental healthcare, and utilizing technology to expand access, particularly in fragile contexts.
- The government must approach inflation and unemployment problems using a pro-poor framework, aiming at reducing their impact on health in general and mental health in particular. Providing financial, physical, and human resources that enable reducing mental illness accompanied by unemployment, inflation-related hardships, geopolitical disruptions, and climate change crises.
- Measuring the Human Development Index (HDI) can be developed to include mental health dimensions. Relying on the life expectancy indicator as a measurement for health level does not necessarily reflect well-being in mental health.

Research Limitations:

The study suffers from several limitations, the first of which is the unavailability of longer time series data, leading to the use of standard econometric methods without taking into account structural considerations. The second limitation is the assumption of a linear relationship between mental health and income inequality, which may not be the reality. The third limitation is the assumption of a direct relation between mental health and income inequality, without testing for intermediate variables.

Future Research:

The research results and limitations faced may open up new research areas that can be conducted in the future, mainly:

- If the data is available, future research can expand to include longer periods and apply econometric methods that take into account structural changes. This can provide additional information about the relation between mental health and income inequality in the MENA region.
- If a nonlinear relationship between mental health and income inequality is assumed, a certain threshold for the distributive effect of income inequality can be identified. If the threshold is exceeded, this will lead to negative effects on mental health in the MENA region.
- If an appropriate time series is available, the spillover impact of income inequality can be analyzed through a range of intermediary channels on mental health.

Reference:

Al-Huseini, S., and Arafat, S. (2025). Mental Health Care in the Middle East. **Springer Nature**. https://link.springer.com/book/10.1007/978-981-95-0461-9

Amar, S., and Pratama, I. (2020). Exploring the Link Between Income Inequality, Poverty Reduction and Economic Growth: An ASEAN Perspective. **International Journal of Innovation**, Creativity and Change. 11(2). 24-41. https://www.researchgate.net/publication/339599413_Exploring_the_Link_between_Income_Inequality_Poverty_Reduction_and_Economic_Growth_An_ASEAN_Perspective

Arias, D., Saxena, S., and Verguet, S. (2022). Quantifying The Global Burden Of Mental Disorders And Their Economic Value. **eClinicalMedicine**, 54. doi:10.1016/j.eclinm.2022.101675

Bechtel, L., Lordan, G., and Rao, D. (2012). Income Inequality And Mental Health: Empirical Evidence From Australia. **Health economics**, **21**, 4-17. doi:https://doi.org/10.1002/hec.2814

Bubonya, M., Cobb-Clark, D., and Wooden, M. (2017). Mental health and productivity at work: Does what you do matter? Labour Economics. Volume 46, June 2017, Pages 150-165. https://www.sciencedirect.com/science/article/abs/pii/S0927537116301506

Cifuentes, M., Sembajwe, G., Tak, S., Gore, R., Kriebel, D., Punnett, L. (2008). The Association Of Major Depressive Episodes With Income Inequality And The Human Development Index. **Social Science & Medicine**. Volume 67, Issue 4, Pages 529-539. https://doi.org/10.1016/j.socscimed.2008.04.003

Das, R., and Chatterjee, A. (2020). Depression rate, GDP growth rate, health expenditure, and voice and accountability: Are there Co-movements? Published Chapter No.7 in the book titled: Multidimensional Perspectives and Global Analysis of Universal Healthcare Coverage. **Advances In Medical Diagnosis, Treatment, And Care (AMDTC) Book Series**. IGI Global Scientific Publishing. pages 182 - 202 DOI: 10.4018/978-1-7998-2329-2.ch007

De Schutter, O. (2024). Special Rapporteur On Extreme Poverty And Human Rights: The Burnout Economy: Poverty And Mental Health. **United Nations General Assembly**. A/79/162 https://documents.un.org/doc/undoc/gen/n24/210/39/pdf/n2421039.pdf

Economist Impact. (2023). Mental Health In The Middle East: Measuring Progress Towards Integrated, Accessible, And Equitable Mental Health. **Janssen Pharmaceuticals Co.** https://assets.ctfassets.net/9crgcb5vlu43/26PXjq5s2lCckwA9NXRB3W/3c05e95070dfcfde110159d1169aefd3/janssen-measuring_mental_health_integration_in_the_middle_east-report-a4-v4.pdf

Fikry, P. (2023). Mental Health In Selected MENA Countries During COVID-19: An Empirical Investigation. **Review of Economics and Political Science**. DOI: 10.1108/REPS-06-2023-0050

Hadipour, A., Delavari, S., and Bayati, M. (2023). What Is The Role Of Institutional Quality In Health Outcomes? A Panel Data Analysis On 158 Countries From 2001-2020. **Heliyon**. Volume 9, Issue 9. e20251. doi:10.1016/j.heliyon.2023.e20251

Healthiw Website. (2025). The Impact of Economic Inequality on Mental Health. **Healthiw Website**.https://healthiw.com/impact-of-economic-inequality-on-mental-health/. Retrieved at: 20.10.2025.

Hussien, H., Hagabdulla, N., Ahmed, K., Albadwi, F., and Alotaibi, K. (2025). The Impact Of Economic Growth on Public Health and Well-Being: An Empirical Analysis of Saudi Arabia. **Journal of Open Innovation: Technology, Market, and Complexity**. Volume 11, Issue 2, June 2025, 100564. https://doi.org/10.1016/j.joitmc.2025.100564

IHME (Institute for Health Metrics and Evaluation) (2019). Global Burden of Disease. In: Mental Health in the MENA Region: Breaking Stigmas and Promoting Well-being.

Institute for Health Metrics and Evaluation. https://duphat.ae/mental-health-in-the-mena-region-breaking-stigmas-and-promoting-well-being/

IMF (International Monetary Fund). (2025). Income Inequality: Introduction to Inequality. https://www.imf.org/en/Topics/Inequality/introduction-to-inequality. **International Monetary Fund (IMF)**. 20.07.2025

Immurana, M., Abdullahi, I., Kisseih, K., Azuug, M., Mohammed, A., Boachie, M., Kizhakkekara, T., Doegah, P., and Dalaba, M. (2024). Interaction Effects Of Mental Health Disorders And Labour Productivity On Economic Growth In Africa. **Global Transitions**, *6*, 221-230. doi:https://doi.org/10.1016/j.glt.2024.09.002

Jofre-Bonet, M., Serra-Sastre, V., and Vandoros, S. (2018). The impact of the Great Recession on health-related risk factors, behaviour, and outcomes in England**. Social Science & Medicine**. Volume 197, January 2018, Pages 213-225. https://doi.org/10.1016/j.socscimed.2017.12.010

Junna, L., Moustgaard, H., and Martikainen, P. (2022). Current Unemployment, Unemployment History, and Mental Health: A Fixed-Effects Model Approach. **American Journal of Epidemiology**. Apr 20;191(8):1459–1469. doi: 10.1093/aje/kwac077 .

Kakemam, E., Mohammadpour, E., Karimi, S., Saeidpour, J., Abbaszadeh, M., and Alizadeh, M. (2024). The Relationship Between Good Governance, Social Support, And Perceived Discrimination With Mental Health Through The Mediation Role Of Quality Of Life: A Cross-Sectional Path Analysis In Iran. **BMC Public Health** volume 24, Article number: 2306 (2024). https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19806-x

Knapp, M., and Wong, G. (2020). Economics And Mental Health: The Current Scenario. **World Psychiatry**. 2020 Jan 10;19(1):3–14. doi: 10.1002/wps.20692. https://pmc.ncbi.nlm.nih.gov/articles/PMC6953559/

KOF Swiss Economic Institute. Data Website. https://kof.ethz.ch/en/data/kof-time-series-database.html

Kuznets, S. (1985). Economic Growth and Income Inequality. In the Book: The Gap Between Rich and Poor, By: Mitchell A Seligson (Ed.). **Routledge** (pp. 25-37). https://doi.org/10.4324/9780429311208-4

Louie, P., Wu, C., Shahidi, F., and Siddiqi, A. (2023). Inflation Hardship, Gender, And Mental Health. **SSM Popul Health**. Jun 12;23:101452. doi: 10.1016/j.ssmph.2023.101452

Macintyre, A., Ferris, D., Gonçalves, B., and Quinn, N. (2018). What Has Economics Got To Do With It? The Impact Of Socioeconomic Factors On Mental Health And The Case For Collective Action. **Humanities and Social Sciences Communications**. volume 4, Article number: 10 (2018). https://www.nature.com/articles/s41599-018-0063-

2#:~:text=Experience%20of%20socioeconomic%20disadvantage%2C%20including,Rogers%20and%20Pilgrim%2C%202010).

McGee, R., and Thompson, N. (2015). Unemployment and Depression Among Emerging Adults in 12 States, Behavioral Risk Factor Surveillance System, 2010. **Prev Chronic Dis**. Mar 2015.19;12:E38. doi: 10.5888/pcd12.140451

Mdingi, K., and Ho, S. (2021). Literature Review On Income Inequality And Economic Growth. **MethodsX**, Volume 8.2021.101402. https://www.sciencedirect.com/science/article/pii/S2215016121001953

Murali, V., and Oyebode, F. (2004). Poverty, Social Inequality, And Mental Health. **Advances in Psychiatric Treatment**. vol. 10, 216–224. Cambridge University Press. https://doi.org/10.1192/apt.10.3.216

Newson, J., and Thiagarajan, T. (2020). Assessment of Population Well-Being With the Mental Health Quotient (MHQ): Development and Usability Study. **JMIR Mental Health**. Vol 7, No 7 (2020): July. https://mental.jmir.org/2020/7/e17935/

Palma, J., and Stiglitz, J. (2016). Do Nations Just Get the Inequality They Deserve? The "Palma Ratio" Re-Examined. In book: Inequality and Growth: Patterns and Policy. Vol. II: Regions and Regularities (pp. 35-97). **Springer**. DOI:10.1057/9781137554598_2

Pham, H. (2025). The Impact of Corruption on the Human Development Index in Countries Worldwide and Policy Implications for Vietnam. **International Journal of Economics, Business and Management Research.**Vol. 9, No.01; 2025 ISSN: 2456-7760. https://doi.org/10.51505/IJEBMR.2025.9118

Rakesh, D., Tsomokos, D., Vargas, T., Pickett, K., and Patel, V. (2025). Macroeconomic income inequality, brain structure and function, and mental health. **Nature Mental Health 3**, 1318–1330 (2025). https://doi.org/10.1038/s44220-025-00508-1

Rubin, A., and Segal, D. (2015). The Effects of Economic Growth on Income Inequality in the US. **Journal of Macroeconomics**. 45. 258-273. https://doi.org/10.1016/j.jmacro.2015.05.007

Salem, M., and Robenson J. (2025). The Impact of Socioeconomic Factors on Mental Health: A Conceptual Framework. **Cureus**. Jul 18;17(7):e88244. doi: 10.7759/cureus.88244

Sapian Labs. (2025). What is your Mental Wellbeing Score? https://sapienlabs.org/mhq/

Shahbazi, F., Shahbazi, M., Poorolajal, J. (2022). Association between socioeconomic inequality and the global prevalence of anxiety and depressive disorders: an ecological study. General Psychiatry Volume 35, Issue 3. https://gpsych.bmj.com/content/35/3/e100735

Thaivalappil, A., Stringer, J., Burnett, L., and Papadopoulos, A. 2023. Institutional Factors Affecting Postsecondary Student Mental Wellbeing: A Scoping Review of the Canadian Literature. **Psych** 2023, 5(3), 630-649; https://www.mdpi.com/2624-8611/5/3/40

Thompson, E., and Kim, S. (2022). Assessing the Relationship between Economic Development and Mental Wellbeing in South Korea. **Iranian Journal of Public Health**. Oct;51(10):2379–2381. doi: 10.18502/ijph.v51i10.11004. https://pmc.ncbi.nlm.nih.gov/articles/PMC9647595/

Torres-Reyna, O. (2007), Panel Data Analysis Fixed and Random Effects Using Stata, http://www.princeton.edu/~otorres/.

UNU-WIDER, (2025). World Income Inequality Database (WIID). Version 29 April 2025. https://doi.org/10.35188/UNU-WIDER/WIID-290425

Wang, Q., and Granados, J. (2018). Economic growth and mental health in 21st century China. **Social Science and Medicine,** 220, 387-395. https://doi.org/10.1016/j.socscimed.2018.11.031

WHO (World Health Organization) (2021). Comprehensive Mental Health Action Plan 2013–2030. **World Health Organization**. https://iris.who.int/server/api/core/bitstreams/69921758-6229-49ba-bd3d-c24736e35829/content

WHO (World Health Organization) (2022). World Mental Health Report: Transforming Mental Health For All. **World Health Organization**. https://iris.who.int/server/api/core/bitstreams/40e5a13a-fe50-4efa-b56d-6e8cf00d5bfa/content

WHO (World Health Organization) (2024). Mental Health Atlas. World Health Organization. https://iris.who.int/server/api/core/bitstreams/5897b3c7-2848-47a7-ba22-0a7902342a81/content

WHO (World Health Organization) (2025). Mental Health Fact Sheet. **World Health Organization**. https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

World Development Indicators Databank. https://databank.worldbank.org/source/world-development-indicators

WGI (Worldwide Governance Indicators). Data Website. https://www.worldbank.org/en/publication/worldwide-governance-indicators

Yang, Y., Niu, L., Amin, A., and Yasin, I. (2024). Unemployment And Mental Health: A Global Study Of Unemployment's Influence On Diverse Mental Disorders. **Frontier Public Health**. Volume 12 – 2024. https://doi.org/10.3389/fpubh.2024.1440403

Zhu, Y. (2024). Study on the Impact of Macroeconomic Changes on Adolescent Mental Health. **Advances in Economics Management and Political Sciences** 135(1):20-26. https://doi.org/10.54254/2754-1169/2024.18812